

MOUNTING BRACKET WITH AN EJECTION MEANS
FOR DETACHABLE RETAINING OF A CYLINDRICAL TANK MEMBER

BACKGROUND OF THE INVENTION

1. Field of The Invention

5 The present invention deals with the field of
devices for holding cylindrical tanks such as self-
contained breathing apparatus and other air tanks
vertically with respect to walls and seats to facilitate
storage thereof and allow emergency personnel to quickly
10 don such breathing assistance gear. These devices
preferably hold the cylindrical tank vertically in a tank
holding zone to facilitate rapid and convenient deployment
thereof for users. Such devices are used often in the seat
back of seats in fire trucks. They are also used in
15 firehouses and other areas frequented by emergency
personnel such as firefighters and the like.

2. Description Of The Prior Art

 There are numerous prior art devices which have
been patented for the purpose of holding cylindrical tanks
20 vertically with respect to a wall surface or a seat back

such as United States Patent No. 1,911,781 patented May 30, 1933 to O. P. Wolfe, Jr. on a "Support And Holder For Brooms, Mops, And The Like"; and United States Patent No. 2,431,698 patented December 2, 1947 to H. Lombard on a "Removable Mounting Installation"; and United States Patent No. 2,903,225 patented September 8, 1959 to B. I. Weinstein and assigned to Lockheed Aircraft Corporation on a "Holder For Drinking Cups And The Like"; and United States Patent No. 3,193,232 patented July 6, 1965 to C. M. Hatcher on a "Radio Bracket or Holder"; and United States Patent No. 3,224,720 patented December 21, 1965 to C. L. Hain and assigned to The Fire Guard Corporation on a "Combined Handle Lock And Bracket For Fire Extinguishers"; and United States Patent No. 3,547,391 patented December 15, 1970 to D. E. Johnson on a "Quick Release Support For Rescue Breathing Apparatus"; and United States Patent No. 3,603,550 patented September 7, 1971 to C. D. Byrd and assigned to Lacy J. Miller Machine Company, Inc. on a "Quick Release Support"; and United States Patent No. 3,780,972 patented December 25, 1973 to J. C. Brodersen on a "Mounting Apparatus for Gas Containers"; and United States Patent No. 3,823,907 patented July 16, 1974 to T. Ziaylek, Jr. on a "Positive Locking Device"; and United States Patent No. 4,213,592 patented July 22, 1980 to D. J. Lingenfelter and assigned to Caterpillar Tractor Co. on a "Bracket Assembly For Mounting Fire Extinguishers Thereon";

and United States Patent No. 4,379,541 patented April 12, 1983 to D. M. Harkness on a "Holder For A Container"; and United States Patent No. 4,391,377 patented July 5, 1983 to T. Ziaylek, Jr. on a "Knock-Down Assembly For Supporting Oxygen Tanks"; and United States Patent No. 4,586,687 patented May 6, 1986 to T. Ziaylek, Jr. on an "Air Tank Support Of The Quick Release Type"; and United States Patent No. 4,848,714 patented July 18, 1989 to T. Ziaylek, Jr. et al on a "Mounting Plate With Rollers"; and United States Patent No. 4,971,275 patented November 20, 1990 to J. C. Roberts on a "Lightweight, Flexible Holder For Scuba Tanks And The Like"; and United States Patent No. 4,997,157 patented March 5, 1991 to H. D. Sweeny and assigned to Swenco Limited on a "Multi-Purpose Canister Wall Bracket"; and United States Patent No. 5,071,100 patented to H. D. Sweeny on December 10, 1991 and assigned to Swenco Limited on a "Multi-Purpose Canister Wall Bracket"; and United States Patent No. 5,190,260 patented March 2, 1993 to R. P. Daubenspeck on a "Water Heater Tank Support"; and United States Patent No. 5,318,266 patented June 7, 1994 to H. Liu on a "Drink Holder"; and United States Patent No. 5,362,022 patented November 8, 1994 to J. E. McLoughlin et al on an "Air Tank Bracket With Strap-Lifting Arms"; and United States Patent No. 5,533,701 patented July 9, 1996 to R. D. Trank on a "Foldable Stabilizing Bracket For Compressed Air Tanks"; and United States Patent No. 5,681,080 patented

October 28, 1997 to G. M. Pond et al and assigned to Seats, Inc. on a "Vehicle Seat For Person Wearing Self-Contained Breathing Apparatus"; and United States Patent No.

5 5,833,195 patented November 10, 1998 to D. H. Haynes and assigned to The United States of America as represented by the Secretary of the Army on a "Gas Retaining Device"; and United States Patent No. 5,890,544 patented April 6, 1999 to R. Love et al on a "Self-Contained Remote Automated Fire Suppression"; and United States Patent No. 6,059,245

10 patented May 9, 2000 to F. Hermansen et al on a "Locking Water Bottle Cage For Bicycles"; and United States Patent No. 6,067,913 patented May 30, 2000 to R. C. Bennett on a "Stackable Pallet System For Transporting Gas Containers"; and United States Patent No. 6,186,166 patented to J. M.

15 Myers on February 13, 2001 and assigned to Myers Quick Drop, Inc. on a "Fire Hose Release Device"; and United States Patent No. 6,220,557 patented April 24, 2001 to M. P. Ziaylek et al and assigned to Michael P. Ziaylek,

20 Theodore Ziaylek, Jr. and Theodore P. Ziaylek on a "Mounting Bracket Means For Detachably Supporting A Generally Cylindrically-Shaped Member Upon A Wall Structure"; and United States Patent No. 6,264,154 patented July 24, 2001 to I. Hiscoz et al and assigned to Rover Group Limited on a "Container Holder For A Motor Vehicle"; and United States Patent No. 6,536,612 patented March 25, 25 2003 to S. Fl. Flores and assigned to Sagarte, S.A. on a

"Support For Casks"; and United States Patent No. 6,543,736 patented April 8, 2003 to B. J. Field and assigned to Pacific Safety Products Inc. on a "Quick Release Supporting Apparatus For A Canister"; and United States Patent No. 6,565,053 patented May 20, 2003 to J. Larky on a "Cane Holder"; and United States Design Patent No. Des.222,527 patented November 2, 1971 to T. Ziaylek, Jr. on a "Bracket For Use With Lifesaving Equipment"; and United States Design Patent No. Des.237,357 patented October 28, 1975 to T. Ziaylek, Jr. and assigned to Ziamatic Corporation on a "Tank Support Bracket For Lifesaving Equipment"; and United States Design Patent No. Des.245,929 patented September 27, 1977 to R. J. Montambo and assigned to The Ansul Company on a "Fire Extinguisher Bracket"; and United States Design Patent No. Des.267,227 patented December 14, 1982 to T. Ziaylek, Jr. and assigned to Ziamatic Corporation on a "Support Bracket For A Gas Cylinder"; and United States Design Patent No. Des.298,704 patented November 29, 1988 to T. Ziaylek, Jr. on a "Seat For Use Primarily In Emergency Vehicles"; and United States Design Patent No. Des.303,738 patented October 3, 1989 to T. Ziaylek, Jr. on a "Rotatable Cylinder Holder"; and United States Design Patent No. Des.314,325 patented February 5, 1991 to T. Ziaylek, Jr. et al on a "Clamping Set Of Bracket Arms For Supporting Tubular Objects"; and United States Design Patent No. Des.319,778 patented September 10, 1991 to T. Ziaylek, Jr.

on a "Vertical Support Brace Bracket Panel For Holding
Tubular Objects"; and United States Design Patent No.
Des.342,666 patented December 28, 1993 to R. G. DePack on a
"Scuba Cylinder Attachment Block"; and United States Design
5 Patent No. Des.347,735 patented June 14, 1994 to T.
Ziaylek, Jr. et al on a "Quick Release Support Tank
Bracket"; and United States Design Patent No. Des.394,381
patented May 19, 1998 to T. Ziaylek, Jr. et al on a "Tank
Bracket"; and United States Design Patent No. Des.419,317
10 patented January 25, 2000 to G. M. Pond et al and assigned
to Seats, Inc. on a "Seat".

SUMMARY OF THE INVENTION

The present invention provides a mounting bracket
having an ejection mechanism for the purpose of detachably
15 retaining a cylindrical tank member with respect to a wall
surface. The mounting bracket itself includes a backing
plate member securable to the wall surface which defines an
ejection zone immediately thereadjacent.

An upper clamping member extends outwardly away
20 from the backing plate member in such a manner as to define
a storage zone adjacent the ejection zone for selectively
retaining and holding of a cylindrical tank member. The
ejection zone itself is preferably positioned between the
tank storage zone and the backing plate member.

The configuration of the upper clamping member preferably includes an upper clamp base secured to the backing plate member for allowing securement of the upper clamping member fixedly with respect to the backing plate member. A first upper clamp arm is included secured to and extending outwardly from the upper clamp base to engage the cylindrical tank member in order to facilitate retaining thereof selectively in the tank storage zone in abutment with respect to the first upper clamp arm. The first upper clamp arm includes a first upper clamp arm protective coating preferably applied thereover by dipping which minimizes damaging of a cylindrical tank member retained within the tank storage zone. The upper clamping member also preferably includes a second upper clamp arm secured to the upper clamp base and extending outwardly therefrom at a position spatially disposed opposite from the location of the first upper clamp arm. The first upper clamp arm and the second upper clamp arm preferably define the tank storage zone therebetween. The second upper clamp arm is adapted to abut the cylindrical tank member oppositely from the first upper clamp arm responsive to the cylindrical tank member being located in the tank storage zone to facilitate selective retaining thereof with respect to the backing plate member. The second upper clamp arm preferably also includes a second upper clamp arm protective coating applied thereover by dipping which

minimizes damaging of a cylindrical tank member retained within the tank storage zone.

The upper clamping member preferably also includes a first upper extension arm which is fixedly secured to the upper clamp base and extends outwardly therefrom approximately perpendicularly with respect to the backing plate member. This first upper extension arm is preferably fixedly secured to the first upper clamp arm which extends outwardly therefrom to define the tank storage zone thereadjacent. A second upper extension arm is also included fixedly secured to the upper clamp base and extending outwardly therefrom oriented approximately perpendicularly with respect to the backing plate member. This second upper extension arm is oriented approximately parallel to and spatially disposed from the first upper extension arm. The second upper extension arm is fixedly secured to the second upper clamp arm which extends outwardly therefrom to facilitate defining of the tank storage zone. The first upper extension arm and the second upper extension arm are preferably of a sufficient size in order to locate the tank storage zone spatially between the first upper clamp arm and the second upper clamp arm at a position sufficiently distant from the backing plate member to provide enough space for mounting of the ejection mechanism on the backing plate member between the backing plate member and the tank storage zone. This area is

defined preferably as the ejection zone. The second upper extension arm is preferably spatially disposed from the second upper extension arm at a distance greater than the size of the cylindrical tank member for preventing movement of the tank therebetween and thus maintaining of the tank within the tank storage zone.

A lower clamping member may also be included which extends outwardly away from the backing plate member at a position below the upper clamping member which further defines a tank storage zone thereadjacent. This tank storage zone is adjacent to the ejection zone for selectively retaining and holding of a cylindrical tank as desired. The ejection zone is preferably positioned between the tank storage zone and the backing plate member. This lower clamp member preferably includes a lower clamp base secured to the backing plate member to facilitate securement of the lower clamping member fixedly with respect to the backing plate member.

The lower clamping member further includes a first lower clamp arm secured to the lower clamp base and extending outwardly therefrom in such a manner as to engage the cylindrical tank member for facilitating retaining thereof selectively in the tank storage zone in abutment with respect to the first lower clamp arm. This first lower clamp arm preferably includes a first lower clamp arm protective coating applied thereover by dipping which

minimizes damaging of a cylindrical tank member retained within the tank storage zone. The lower clamping member may further include a second lower clamp arm secured to and extending outwardly from the lower clamp base at a position spatially disposed oppositely from the first lower clamp arm. This first lower clamp arm and the second lower clamp arm preferably further define the tank storage zone therebetween. The second lower clamp arm is adapted to abut the cylindrical tank member oppositely from the first lower clamp arm responsive to the cylindrical tank member being positioned in the tank storage zone for the purpose of facilitating selective retaining thereof with respect to the backing plate member. The second lower clamp arm includes a second lower clamp arm protective coating preferably which is applied thereover by dipping which minimizes damaging of a cylindrical tank member positioned in the tank storage zone.

The lower clamping member further includes a first lower extension arm fixedly secured to the lower clamp and extending outwardly therefrom approximately perpendicularly with respect to the backing plate member. This first lower extension arm is preferably fixedly secured to the first lower clamp arm which extends outwardly therefrom to define the tank storage zone immediately thereadjacent preferably. The lower clamping member further includes a second lower extension arm fixedly secured to the lower clamp base. It

extends outwardly therefrom approximately perpendicularly with respect to the backing plate member preferably. The second lower extension arm preferably is oriented approximately parallel to and spatially disposed from the first lower extension arm. The second lower extension arm preferably is fixedly secured to the second lower clamp arm which extends outwardly therefrom for the purpose of facilitating defining of the tank storage zone thereadjacent. The first lower extension arm and the second lower extension arm are preferably large enough to position the tank storage zone at a sufficient distance from the backing plate member to facilitate mounting of the ejection mechanism on the backing plate member between the backing plate member and the tank storage zone. This area is defined as the ejection zone preferably. The second lower extension arm is preferably spatially disposed from the first lower extension arm at a distance less than the size of the cylindrical tank member to prevent positioning of the tank therebetween.

An ejection mechanism is included secured to the backing plate member within the ejection zone. It is adapted in the steady state position to exert a force continuously against the cylindrical tank member when positioned within the tank storage zone for the purpose of urging ejecting movement thereof outwardly unless it is restrained properly therewithin. The ejection mechanism is

capable of being forced to move to a compressed position completely located within the ejection zone whenever the cylindrical tank member is firmly secured within the tank storage zone. This ejection mechanism is preferably
5 secured to the backing plate member at a position below the upper clamping member and above the lower clamping member to facilitate operative ejection of a cylindrical tank member unless the restraining mechanism is properly engaged.

10 The ejection mechanism preferably includes a flat spring which is flexibly resilient and is attached at one end to the backing plate member. A bumper means is secured on the flat spring for the purpose of facilitating the exerting of force against a cylindrical tank member
15 positioned within the tank storage zone while minimizing damaging thereof.

A restraining means is preferably included comprising a restraining strap which is flexible and is attached with respect to the backing plate member. It is
20 preferably adapted to extend around the cylindrical tank member for selective retaining thereof within the tank storage zone and for retaining of the ejection mechanism in the compressed position in abutment with respect to the cylindrical tank member responsive to retaining of the
25 cylindrical tank member in the tank storage zone.

Structurally the restraining mechanism preferably includes a first clasp means attached with respect to the backing plate and extends outwardly therefrom. The restraining means further includes a second clasp means attached with respect to the restraining strap means and detachably engageable with respect to the first clasp means to detachably secure the restraining strap in position extending around a cylindrical tank member when positioned in the tank storage zone with the ejection means held in the compressed position. The first clasp is preferably fixedly secured rigidly with respect to the backing plate member to facilitate selective detachment and detachable securement of the second clasp with respect to the first clasp by the one hand of a user while simultaneously making the user's other hand free to hold the cylindrical tank member within the tank storage zone. The restraining strap further includes an upper strap section attached with respect to the backing plate and extending outwardly therefrom. This upper strap section extends around the cylindrical tank member positioned within the tank storage zone and is attached with respect to the first clasp for detachable securement around the tank. The upper strap section is attached to the backing plate member at a position immediately below the upper clamping member. Similarly a lower strap section is included in the restraining means which is attached with

respect to the backing plate member at a location beneath the upper strap section and extending outwardly therefrom. The lower strap section extends around a cylindrical tank member positioned within the tank storage zone and is
5 attached with respect to the first clasp for detachable securement therearound. The lower strap section is preferably attached to the backing plate member at a position immediately below the lower clamping member.

The present invention preferably also includes a
10 lower shelf member secured to the backing plate member and extending outwardly therefrom to provide lower support for a cylindrical tank member positioned in the tank storage zone. This lower shelf member preferably extends outwardly from the lower portion of the backing plate member at an
15 angle with respect thereto that is greater than 90 degrees to facilitate passive ejection of the cylindrical tank member from the tank storage zone unless firmly retained therewithin by the restraining mechanism.

It is an object of the present invention to
20 provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which maintains the cylindrical tank in vertical orientation.

It is an object of the present invention to
25 provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with

respect to a wall surface which automatically ejects the tank from the bracket if the tank is not properly restrained therein.

5 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which requires affixing of a positive restraining means for holding the tank in the tank holding zone within the bracket in order for the tank to remain in place adjacent the bracket.

10 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which includes a lower shelf extending outwardly from the lower portion of the bracket for supporting a tank positioned within the tank storage zone wherein the bracket is inclined downwardly at greater than 90 degrees with respect to the backing plate to facilitate passive ejection of a cylindrical tank member therefrom.

20 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which allows a user with one hand to hold the tank in the tank storage zone while the other hand can latch a fully operable one-handed clasping

25

mechanism.

5 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which includes a backing plate mounted with respect to a wall surface with an ejection mechanism positioned within an ejection zone immediately thereadjacent and a tank storage zone positioned immediately thereadjacent at a position outwardly from the backing plate.

10 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface wherein an ejection zone is defined between the tank storage zone and the backing plate to receive an ejection mechanism therein to facilitate ejection of the cylindrical tank member from the tank storage zone if the restraining mechanism is not properly and positively engaged.

15 It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which minimizes a number of moving parts.

20 It is an object of the present invention to provide a mounting bracket with an ejection means for

detachably retaining of a cylindrical tank member with respect to a wall surface which is easily maintained.

It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which is of limited initial capital cost.

It is an object of the present invention to provide a mounting bracket with an ejection means for detachably retaining of a cylindrical tank member with respect to a wall surface which can be used to allow emergency personnel to quickly put on a self-contained breathing apparatus from its storage location mounted upon a vertically extending wall.

BRIEF DESCRIPTION OF THE DRAWINGS

While the invention is particularly pointed out and distinctly claimed in the concluding portions herein, a preferred embodiment is set forth in the following detailed description which may be best understood when read in connection with the accompanying drawings, in which:

Figure 1 is a perspective illustration of an embodiment of the mounting bracket with ejection means of the present invention and of a cylindrical tank member for use therewith;

Figure 2 is a front plan view of the embodiment shown in Figure 1;

Figure 3 is a three-quarter right perspective view of the embodiment shown in Figure 1;

5 Figure 4 is a top plan view of the embodiment shown in Figure 1 illustrating an expanded view of the backing plate and ejection zone area showing the ejector in the compressed position;

10 Figure 5 is a top plan view of the embodiment shown in Figure 1 showing the ejector mechanism in the extended position; and

15 Figure 6 is a side plan view of the embodiment shown in Figure 1 illustrating an expanded view of the lower shelf and angular relationship thereof with respect to the backing plate member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20 The present invention provides a unique configuration for a mounting bracket adapted to detachably retain a cylindrical tank member 11 with respect to a wall surface 10 which is preferably oriented extending vertically. The mounting bracket configuration includes a backing plate member 12 which can be secured as needed with respect to a wall 10 and which includes an upper clamping member 18 and a lower clamping member 38 defined thereon

along with a lower shelf 78 which cooperate to facilitate
securement of a cylindrical tank member 11 thereto.

Preferably the backing member 12 is generally flat and
extends vertically along the wall 10 to facilitate

5 securement thereto. Upper clamping member 18 is secured to
the backing plate 12 near the upper portion thereof. Lower
clamping member 38 is secured to the backing plate member
12 along the lower portion thereof and below the lower
clamping member 38 a lower shelf 78 is positioned for
10 supporting from beneath a cylindrical tank 11 which is
being held with respect to the mounting bracket.

The configuration of the upper clamping member 18
and the lower clamping member 38 is extremely important in
regard to analyzing the novelty of the present invention.

15 The upper clamping member 18 preferably includes an upper
clamp base 20 which is secured fixedly directly to the
backing plate member 12. Upper clamping member 18
preferably includes a first upper extension arm means 30
fixedly secured with respect to the upper clamp base 20 and
20 extending outwardly therefrom approximately perpendicular
with respect thereto. Similarly upper clamp base 20 will
include also a second upper extension arm 32 extending
outwardly therefrom approximately perpendicular with
respect thereto. The first upper extension arm 30 and the
25 second upper extension arm 32 will extend outwardly from
the upper clamp base 20 spatially distant from one another

and approximately parallel to each other. The distance between the first upper extension arm 30 and the second upper extension arm 32 is shown by distance reference 34. This distance 34 should be less than the size of the smallest cylindrical tank 11 with which the bracket of the present invention will be used in order to prevent such a tank from ever being positioned between the first upper extension arm 30 and the second upper extension arm 32.

A first upper clamp arm 22 will be secured to and extend outwardly from the first upper extension arm 30. First upper clamp arm 22 will extend outwardly therefrom and be angularly oriented with respect thereto. Similarly a second upper clamp arm 26 will be fixedly secured with respect to the second upper extension arm 32 and will extend outwardly therefrom with an angular relationship thereto such that the second upper clamp arm 26 extends away from the first upper clamp arm 22 and the defines therewith a generally concave shape for facilitating the defining of a tank storage zone 16 therebetween. With this configuration whenever a cylindrical tank 11 is positioned within the tank storage zone 16 it can be brought into abutment with respect to the first upper clamp arm 22 and the second upper clamp arm 26 for firm securement in abutment thereagainst to prevent damage to the surface of the cylindrical tank 11. A first upper clamp arm protective coating 24 is preferably positioned extending

over and across the first upper clamp arm 22. Similarly protection of the cylindrical tank 11 is enhanced by the inclusion of a second upper clamp arm protective coating 28 extending over the second upper clamp arm 26.

5 It should be appreciated that the distance between the first upper clamp arm 22 and the second upper clamp arm 26 is sufficiently wide to define the tank storage zone 16 and, as such, can receive a cylindrical tank member 11 positioned therebetween. However, the first upper
10 extension arm 30 and the second upper extension arm 32 are only separated by a distance 34 which is less than the size of the smallest cylindrical tank 11 with which the present invention will be utilized. As such, the tank storage zone 16 is defined only between the first upper clamp arm 22 and
15 the second upper clamp arm 26. As such, a cylindrical tank 11 will always be maintained spaced apart from the backing plate member 12. This area between the backing plate member 12 and the tank storage zone 16 defined within the first upper clamp arm 22 and the second upper clamp arm 26
20 will be defined as the ejection zone means 14. In Figures 4 and 5 the boundary between the ejection zone 14 and the tank storage zone 16 is specifically defined by the dividing line 13. The ejection zone 14 is defined specifically for the purpose of mounting of an operative
25 ejection means 56 to the backing plate member 12 immediately in or adjacent to the ejection zone 14 for the

purpose of facilitating removal of the cylindrical tank 11 from the tank storage zone 16 when the tank is not firmly secured therewithin. The ejector mechanism can take various configuration however in the present invention it includes a flat spring 62 with a bumper means 64 mounted therein. Flat spring 62 includes one end thereof secured directly to the backing plate 12 and the other end flexibly extending outwardly therefrom and including the bumper 64 mounted thereon. This flat spring means 62 which comprises the ejection means 56 is movable between an extended position 58 which is the steady state position of the ejection means 56 as shown best in Figure 5 and a compressed position 60 shown best in Figure 4. In the steady state position the flat spring 62 and hence the ejection mechanism 56 will be oriented such that it extends into the tank storage zone 16. However, when the cylindrical tank 11 is firmly secured within the tank storage zone 16 the wall of tank 11 will exert pressure against the flat spring 62 through the bumper 64 and will move it to the compressed position 60 wherein the entire ejection mechanism 56 is maintained within the ejection zone 14 in this compressed position 60. Any time the tank 11 is removed from the tank storage zone 16 the flat spring 62 will return to the steady state extended position 58 such that it extends out of the ejection zone 14 across the dividing line 13 and into the tank storage zone 16. This

mechanism has the purpose of urging the cylindrical tank 11 to disengage from the mounting bracket and in particular the upper clamping member 18 and the lower clamping member 38 thereof whenever the tank 11 is not firmly held within the tank storage zone 16. As such, when a user wishes to position a cylindrical tank 11 secured to the mounting bracket initially the user will use one hand to hold the cylindrical tank 11 in abutment with respect to the upper clamping member 18 and the lower clamping member 38 which will urge the cylindrical tank 11 to push against the ejection means 56 and move it to the compressed position 16 contained entirely within the ejection zone 14. The user will then use the other hand to secure the restraining means 66. Once the restraining means 66 is firmly engaged and secured the cylindrical tank 11 will be held in the tank storage zone 16 and the ejection means 56 will be firmly held in the compressed position 60 within the ejection zone 14. If for any reason the restraining means 66 is improperly attached such as it does not hold the tank securely the ejection mechanism 56 will push the cylindrical tank 11 out of engagement with respect to the upper clamping member 18 and the lower clamping member 38 such that it is released by the mounting bracket. However, as long as the cylindrical tank 11 is retained by the restraining means 66 in the tank storage zone 16 firmly the ejection means 56 will be maintained in the collapsed

position and will be held within the ejection zone 14.

The mounting bracket of the present invention will preferably also include a lower clamping member 38. Lower clamping member 38 specifically includes a lower clamp base 50 which is directly secured fixedly with respect to the backing plate 12. Lower clamp base 40 preferably includes a first lower extension arm 50 extending outwardly therefrom and a second lower extension arm 52 extending outwardly therefrom. Preferably extension arms 50 and 52 extend approximately parallel with respect to one another and are spatially distant from one another as shown by distance line 54 in Figure 2. This distance will preferably be less than the diameter of the smallest cylindrical tank 11 with which the present invention will be usable. As such, this construction prevents any possibility of the cylindrical tank 11 of being capable of being positioned between the first lower extension arm 50 and the second lower extension arm 52. A first lower clamp arm 42 will preferably be fixedly secured to and possibly integral with respect to the first lower extension arm 50 to extend outwardly and laterally therefrom. Similarly a second lower clamp arm 46 will be fixedly secured to and preferably integral with respect to the second lower extension arm 52 to extend laterally outwardly therefrom. Preferably the first lower clamp arm 42 and the second lower clamp arm 46 will extend laterally away from one

another to define a generally concave surface which defines therebetween the lower portion of the tank storage zone 16. Thus the tank storage zone 16 will be defined between the first lower clamp arm 42 and the second lower clamp arm 46 for holding of cylindrical tank 11 therein. However, movement of the cylindrical tank 11 further inwardly toward the backing plate member 12 of the lower clamping member 38 to a position between the first lower extension arm 50 and the second lower extension arm 52 will be prevented by limiting the distance 54 between arms 50 and 52 to less than the size of the smallest cylindrical tank 11 with which the present invention can be usable. When the cylindrical tank 11 is positioned in the tank storage zone 16 it is preferable that it will abut the first lower clamp arm 42 and the second lower clamp arm 46. Prevention of damage to the external surface of the cylindrical tank 11 is enhanced by the inclusion of a first lower clamp arm protective coating 44 extending over the first lower clamp arm 42 in the area thereof which will be brought into abutment with the cylindrical tank 11 when positioned in the tank storage zone 16. Similarly a second lower clamp arm protective coating 48 will preferably be positioned extending over the surface of the second lower clamp arm 46 in such a manner that a cylindrical tank 11 positioned within the tank storage zone 16 will be brought into abutment therewith and the external surface of the tank

will be similarly protected.

The area between the first lower extension arm 50 and the second lower extension arm 52 which cannot be entered by the cylindrical tank 11 because it is larger than the distance 54 therebetween is established for the purpose of defining the lower portion of the ejection zone 14 therein. This ejection zone 14 provides a spacing required for the operation of the ejection mechanism 56 therewithin. This ejection mechanism 56 can take any configuration but in the present embodiment includes a flat spring 62 with a bumper means 64 attached thereto. One end of the flat spring 62 is secured to the backing plate member 12 within the lower portion of the ejection zone 14 and the other portion of the flat spring member 62 will exert an outward bias on the bumper 64 which be exerted against a cylindrical tank 12 whenever it is positioned within the tank storage zone 16. When cylindrical tank 11 is firmly held within the tank storage zone 16 the flat spring 62 and the bumper 64 of the ejection mechanism 56 will be held within the ejection zone 14. On the other hand when a cylindrical tank 11 is not positioned within the tank storage zone 16 the flat spring 62 and bumper 64 of the ejection mechanism 56 will extend through the ejection zone 14 into the tank storage zone 16 and this is the steady state position of this ejector mechanism. This steady state extended position 58 is shown in Figure 5 and

the compressed position 60 is shown best in Figure 4 with the outer surface of the cylindrical tank exerting pressure on the bumper 64 for holding the entire ejection mechanism 56 within the ejection zone 14.

5 The restraining means used with the present invention can assume various configurations. As shown in the figures of the present invention the preferred configuration contemplated at the present time is a restraining strap 68. This restraining strap 68 will
10 include an upper strap section 70 and a lower strap section 72. These two members join together at a second clasping means 76. A first clasping means 74 is secured to a rigid fixture 82 which extends outwardly therefrom. Rigid
15 fixture 82 is preferably fixedly secured to the backing plate member 12 in such a manner as to be rigidly maintained thereby. The first clasping means 74 will be secured to the rigid structure 82. First clasp 74 and second clasp 76 will be detachably securable with respect to one another to firmly secure the restraining strap 68
20 about a cylindrical tank 11 positioned within the tank storage zone 16 for firmly holding it therewithin.

 In the preferred configuration of the present invention the fixture 82 will be rigid and will hold the first clasp 74 at the outermost position thereon as shown
25 best in Figures 1, 2 and 3. The second clasp 76 will be secured with respect to the upper strap section 70 and the

lower strap section 72 and preferably will be connected with respect to a flexible restraining strap 68. The flexibility of the restraining strap 68 and the rigid structure of the fixture 82 will allow the user to engage the first clasp with respect to the second clasp 76 with one hand. This is important because the user who is attempting to mount the cylindrical tank 11 to the mounting bracket of the present invention needs to use the other hand to hold the cylindrical tank 11 in the tank storage zone 16. This is necessary because the ejection mechanism 56 will cause the cylindrical tank 11 to be ejected from the tank storage zone 16 unless force is exerted from some source to hold it in position. Initially this source will be one hand of a user. However, after the user uses his other hand to engage the first and second clasping means 74 and 76 with respect to one another, the cylindrical tank 11 will now be detachably but firmly held in the tank storage zone 16 and a successful mounting has been achieved. And, in this manner a single person can easily mount a cylindrical tank 11 to the mounting bracket of the present invention. This is made possible because one hand is required to be used to hold the cylindrical tank 11 in position in the tank storage zone 16 while the other hand can achieve engagement between the first and second clasps 74 and 76 which is a one-handed operation because of the forming of the fixture 82 as a rigid member fixedly secured

to the backing plate member 12 and extending outwardly therefrom.

A further enhancement of the present invention is included by the specific orientation of the lower shelf 78 with respect to the backing plate member 12. To further facilitate ejection of a cylindrical tank 11 from the tank storage zone 16 responsive to a lack of firm securement of the tank with respect to the mounting bracket of the present invention, the lower shelf means 78 is preferably angled downwardly outwardly away from the backing plate member 12. As shown best in Figure 6 this orientation achieves an angle between the backing plate 12 and the lower shelf means 78 which is greater than 90 degrees. Angle 80 when chosen greater than 90 degrees will help the ejection mechanism 56 in achieving its overall purpose of ejecting a cylindrical tank 11 from its position adjacent to the mounting bracket of the present invention responsive to an incomplete securement thereof with respect to the mounting bracket. By having the lower shelf 78 angled slightly away and downwardly from the backing plate member 12 instead of being oriented approximately perpendicularly with respect thereto enhances significantly the operation of ejection mechanism 56 by more easily allowing the cylindrical tank 11 to fall away therefrom when improperly secured in place.

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While particular embodiments of this invention have been shown in the drawings and described above, it will be apparent, that many changes may be made in the form, arrangement and positioning of the various elements of the combination. In consideration thereof it should be understood that preferred embodiments of this invention disclosed herein are intended to be illustrative only and not intended to limit the scope of the invention.